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# **The role of consultation sources revisited:**

## **An empirical study of English-Chinese translation**

### **Abstract**

This paper contributes to empirical research into expertise in translation by investigating how translators approach source texts and how they use consultation sources, specifically dictionaries, to inform their translation choices. Subjects participating in the study described were divided into three groups - Novice, Semi-professional and Professional translators - based on their levels of experience in translation. The aim of the study described was to determine if and how experience affects the way in which translators approach the translation task. Data obtained from Think-aloud protocols, translation evaluations and retrospective interviews were triangulated. As a result, findings show that: i) consultation aims tend to evolve from comprehension to expression as experience in translation increases; ii) professional translators tend to be more flexible and diversified in their use of consultation sources: the selection of consultation methods is related to multiple factors such as text style, time pressure and personal preferences; and iii) professional translators display an investigative attitude towards consultation sources: they have a better understanding of how to use consultation sources with maximum efficiency, regularly engaging in reverse lookup activities and showing a higher frequency of use of Predominantly Internal Support. Finally, in addition to translation experience, consultation proficiency has been found to be a significant factor in determining the frequency of consultation, and the efficiency of the translation process.

**Keywords:** consultation sources; consultation process; Think-aloud protocols; investigative attitude; translation experience

## **1. Introduction**

The PACTE group defines translation competence as the underlying system of knowledge required to translate (PACTE, 2011, p.33). In their model (PACTE, 2003), translation competence comprises five sub-competences as well as psycho-physiological components. The five sub-competences are: Bilingual competence, Extra-linguistic competence, Knowledge about Translation, Instrumental competence and Strategic competence. Instrumental competence here refers to “predominantly procedural knowledge related to the use of documentation sources and information and communication technologies applied to translation” (PACTE, 2003, p.59).

The study described in this paper analyses the use of consultation sources<sup>1</sup> in English to Chinese translation<sup>2</sup>. The result of pioneering research into the consultation process, it investigates the interaction of consultation aims, methods, decisions and outcomes by obtaining answers to the following series of linked questions from three experience-based categories of translators: what are translators’ consultation aims?; what consultation methods do they use?; what kind of decisions do they make?; and what outcomes (including the number and acceptance rate of consultations) do they achieve? Data was obtained from Think-aloud protocols (TAPs), translation evaluations and retrospective interviews and triangulated.

## **2. Theoretical background**

When considering instrumental competence in translation studies (TS), some translation theorists (Newmark, 1988; Zhou, 1997) have focused their attention on the types of dictionary used in translation, and have advanced rules and principles for their use. Such prescriptive-oriented perspective has made a significant contribution to TS, especially to translation pedagogy. It has, however, been criticized as being limited to reflecting only the idiosyncratic experience of the theorist, and for not taking a more holistic approach towards the consultation sources used by professional translators. In the mid-1980s, a group of researchers imported the use of Think-aloud protocols (TAPs) from the cognitive sciences for the purpose of collecting data in translation process research. The first process-oriented research into instrumental competence using TAPs focused mainly on printed sources (especially dictionaries). Krings (1986) and Jääskeläinen (1989a; 1989b) found that professional translators tended to display a lower frequency of use of bilingual dictionaries compared with non-professional translators, while the opposite is true for their use of monolingual dictionaries. Jääskeläinen (1989a, 1989b) and Wakabayashi (2003) also found that non-professional translators had a higher frequency of use of reference material than professional translators, and they over-relied on consultation sources rather than working out unfamiliar or problematic words or phrases based on context. Künzli (2011) compared three professional translators with three translation students in their use of information

sources when translating, and found “a correlation between the range of information sources used, expertise of translation and translation quality. However, the preference of a certain type of source (e.g., monolingual vs. bilingual dictionaries) is not associated with translation quality” (Künzli 2001, p.507).

Atkins and Varantola (1997) published a thought-provoking report based on what has been considered as “a lengthy and well thought-out survey-questionnaire” (McCreary, 2000, p.155) completed by 71 lexicographers and 32 Finnish translation students. It takes account of “the various steps in the process of consulting a dictionary, the type of information commonly sought, the choice between a bilingual and a monolingual dictionary, the outcome of the searches, strategies employed when a search failed, etc.” (Atkins & Varantola, 1997, p.1). Using a recording sheet in which translation students described their feelings regarding their level of satisfaction with dictionary searches, Mackintosh (1998) reported that the two major causes of the students’ dissatisfaction with bilingual dictionaries were either that the entry was missing (88%) or that the entry contained no exact equivalent (29%) (as cited in McCreary, 2000, p.154). Regarding attitude and self-confidence towards consulting sources, House (2000) and Fraser (1994, 2000) have argued that professionals are high-risk-takers, while non-professionals are low-risk-takers. The former maintain their confidence with or without the help of sources; while the latter, by contrast, lose confidence if they do not have reliable reference books to hand.

Much has been written on the use of consultation sources over the past decade, ever since PACTE (2003) highlighted the importance of instrumental competence as an indicator of translation expertise. Based on the data collected from 35 expert translators and 24 foreign-language teachers, PACTE (2009) analysed the use of different sources of documentation (external support) and found out that instrumental competence is not as highly developed amongst foreign-language teachers as amongst expert translators, who use external support much more often both in direct and inverse translation (PACTE, 2009, p.227). In line with the above finding, Law (2009) examined translation students’ use of dictionaries in Chinese to English translation and found that most respondents had not been well trained in using Chinese-English dictionaries. Alves and Liparini Campos (2009) also studied the impact of consultation on the performance of professional translators and concluded that “although documentation is an important source of the support in translating, ...professional translators rely mostly on their own knowledge to solve translation problems” (Alves & Liparini Campos, 2009, p.208).

Alves (1997) when considering decision-making in the translation process, put forward the concept of internal support (the translators’ personal worldview) and external support (documentation sources) to differentiate the two main strategies employed by translators. PACTE (2009, p.223) subsequently further divided each of the categories of internal and external support into two subcategories: (1) Internal Support, (2) Predominantly Internal Support, (3) Predominantly External Support and (4) External Support. This classification was later adopted by Alves and Liparini Campos (2009) in their in-depth study of orientation and revision strategies in translation. Prassl (2010) outlined four levels of decision-making within the translation

process: routinized decisions, stereotype decisions, reflected decisions and constructed decisions. ‘Routinized decisions’ and ‘stereotype decisions’ may be considered to be equivalent to ‘Internal Support’ in PACTE (2009). ‘Reflected decisions’, which “begin with automatically retrieved options but, if the spontaneous process is disturbed, options have to be generated consciously and deliberately using internal or external search followed by evaluation” (Prassl, 2010, p.62), would account for PACTE’s categories of ‘Predominantly Internal Support’, ‘Predominantly External Support’ and ‘External Support’. ‘Constructed decisions’ occur when the reflected decision-making process fails to complete the decision, and “the translator has to resort to guessing to come to a conclusion” (Prassl, 2010, p.63). This type of decision does not fit into any of the PACTE (2009) categories, but it does correspond to the ‘Problem Shelved (PS)’ decision in the present study.

### **3. Research design**

#### ***3.1 The subjects***

Undifferentiated subjects were initially used in think-aloud studies on translation (Krings, 1986; Séguinot, 1989). These studies were later followed by comparative studies of professional and novice translators (Kiraly, 1995; Jonasson, 1998). This two-category division of subjects has, however, been considered too limited to produce valid data: “There are many more categories to study than just novice and expert or student and professional” (Shreve, 2002, p.160). In his theoretical analysis of the acquisition of translation competence, Chesterman (1997, pp.147-167) applied Dreyfus and Dreyfus’s (1986) five-stage skill acquisition model in which skills are developed through “novice”, “advanced beginners”, “competent”, and “proficient”, to “expert” level. Nevertheless, with the development of empirical translation studies, a longitudinal study “involving the analysis of translation products and processes of the *same* individuals *at regular intervals* during training and later professional career” (Göpferich et al., 2011, p.58), would ideally be the method of choice for investigating translation competence.

In the present study, a three-category division of subjects was adopted based on following considerations: 1) practical time restrictions made a longitudinal study impossible in this research project; 2) the in-depth nature of this study and the need for a representative sample in each category made it difficult to expand the categories to five. Thus, 18 out of 20 volunteer subjects<sup>3</sup>, for whom Chinese was their L1 and English their L2 languages, were divided into three groups: Professional, Semi-professional and Novice translators. This categorization was based on information provided in a questionnaire used for selection purpose.

Since subjects were to translate texts from English into Chinese (L2 to L1), their level of proficiency in English could have had an impact on their consultation performances. Bearing this in mind, the score they obtained in the Test of English as a Foreign Language (TOEFL), one of the most popular and prestigious English tests in

China, was used as a selection criterion. All subjects selected had obtained over 610 (“advanced plus” language proficiency) in their paper-based test, with average scores of 617 (Novices); 619.17 (Semi-professionals); and 620.67 (Professionals), respectively. Paired t-tests showed that there were no statistically significant differences between the different groups ( $p=0.441>0.05$  for Novices and Semi-professionals;  $p=0.640>0.05$  for Semi-professionals and Professionals; and  $p=0.230>0.05$  for Novices and Professionals). Regression analysis revealed that there was no statistically significant correlation between TOEFL scores and translation performance the experiment<sup>4</sup>. Table 1 shows the classification of subjects:

Table 1. Classification of subjects

Subject	Age range	TOEFL average score	Translation experience
Novice translators (S1-S6)	20-24	617	Undergraduates in beginners’ translation courses; with limited formal translation experience; a minimum TOEFL score of 610 and typically 10+ years studying English; never having had any income from translation work and no officially published translations. <sup>5</sup>
Semi-professional translators (S7-S12)	25-29	619.17	Postgraduates in a Translation Studies programme; with over three years part-time translation experience; no full-time professional translation experience; occasional income from translation work; and no officially published translations.
Professional translators (S13-S18)	25-44	620.67	Professional translators with more than 4 years’ full-time translation experience; more than half of their income from translation work; and with some officially published translations.

### 3.2 The source texts

To ensure that the English source texts (STs) were suitable for the purposes of this study, text selection criteria were established with reference to the Institute of Linguists’s (IoL) regulation for its general translation examination: “a text of a demanding but non-specialised nature” (IoLET, 2011, p.6). A small-scale pre-test was run before the formal experiment. The text selection criteria established were as follows:

- (1) The theme and style of the texts should not show obvious partiality (e.g. domain specific texts) to the interests or advantage of any subject vis-à-vis others.
- (2) The texts should be authentic in content, clear and well written, produced by native English writers as a guarantee of accuracy and fluency in both content and expression.
- (3) The texts should exhibit a high degree of complexity so that they demand intensive cognitive processing and elicit differentiated performances from different types of subject.

Based on the above criteria, a popular science essay and a political speech were selected as source texts for the experiment. Text 1 was an excerpt from a popular science essay by Isaac Asimov, a famous American biochemist and writer, whose

articles have attracted a large number of readers all over the world. It was considered that subjects, whatever their interests or backgrounds, would experience little difficulty with lexical cognition or stylistic expression. Text 2 was an excerpt from former US President George Bush's welcome speech to Chinese Premier Wen Jiabao at the White House in 2003. An authentic speech of this kind includes more rhetorical devices and diplomatic phraseology than other categories, a fact which makes it a touchstone for testing the problem-solving abilities of translators. Table 2 gives a description of Text 1 and Text 2.

Table 2. Description of Text 1 and Text 2

	Words	Complex words*	Sentences	Words per sentence
Text 1	178	19	11	16.2
Text 2	222	31	13	17

\*The complex words are marked and calculated by *EditCentral*

Readability indices as suggested by Jensen (2009) were adopted to ensure that the selected STs met the third criterion mentioned above. The average scores for Text 1 and Text 2 based on all five U.S. reading grade levels (Automated Readability Index, Flesch-Kincaid index, Coleman-Liau index, Gunning-Fog index and SMOG index) indicated that to successfully comprehend the texts, a reader would have had to have completed 9.72 and 11.08 years of schooling respectively. The Flesch Reading Ease (FRE) index and the LIX<sup>6</sup> formula both return numerical scores (see figure 1). On the FRE scale, the readability score for Text 1 was 63.5, and for Text 2 it was 54.1, which correspond to 'standard' (60-70) and 'fairly difficult' (50-60) respectively (Flesch, 1974, p.149). Using the LIX formula, the readability score for Text 1 was 54.1 and for Text 2 it was 58, which correspond to 'difficult text' (45-55) and 'very difficult text' (>55) respectively (Björnsson, 1983, p.484). Based on the above scores, both STs were thus deemed to exhibit a high degree of complexity for subjects with English as their L2.

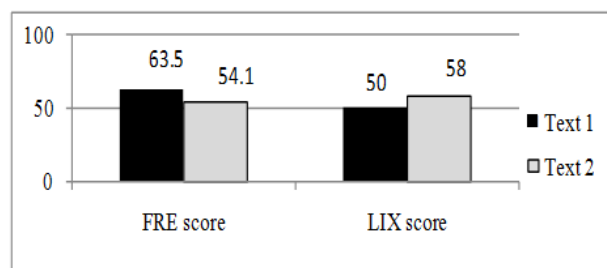


Figure 1. FRE score (generated by EditCentral) and LIX score (generated by Scorestandards-schmandards)

### 3.3. Experiment procedure

#### 3.3.1. Think-aloud training



Subjects were trained in advance of the experiment to become adapted to, and qualified for, participating in thinking aloud experiments. They were asked to answer three logic questions and at the same time verbalize anything that came to mind, while strictly avoiding introspective remarks or explanations. The preliminary training exercises also provided subjects with the opportunity to familiarize themselves with the experimental environment in a usability lab. In addition to the recording devices that were indispensable for the experiments, the lab was also equipped with dictionaries, reference books and a computer with software dictionaries and internet access.

### *3.3.2. Data collection*

Data was collected from Think-aloud protocols, translation evaluations and retrospective interviews. A total of 36 translated texts were obtained from eighteen subjects who were asked to think aloud while translating. Subjects translated in individual sessions over a one-month period. Each subject translated two texts in a single session with a fifteen-minute interval between each. Once their session was completed, subjects were asked not to discuss the experiment or the content of the texts with anyone. Each subject began with a warm-up exercise before the formal experiment. S/he was then given the two STs with a translation brief and asked to verbalize their thoughts while simultaneously translating (concurrent thinking aloud). The researcher responsible for the session was seated in a room next to the usability lab, observing subjects' actions through a glass partition and taking notes. Verbal reporting and physical actions were recorded using audio and video devices. Since verbal reporting inevitably delays cognitive processing (Jakobsen, 2003), subjects were not restricted to a time limit. Finally, after the completion of the translation tasks, a follow-up interview with some general questions about consultation habits was carried out. The definition of "a consultation" used was that of Atkins and Varantola (1997, p.5): "a consultation designates the looking up of one entry, once, in one dictionary or other resource". The unit of observation, namely each consultation performance starting from the report of consulting resources to the end of the consultation, was mainly extracted from TAP data. The detailed observation notes made at the time and video records served as supporting data to confirm each consultation performance. Some data extracted from retrospective interviews were used as supporting evidence in the qualitative analysis of this study.

### *3.3.3 Transcription*

The conventions for TAP transcription are far from fixed, and researchers design transcription conventions on the basis of their own specific research aims. For this paper, the conventions (see Appendix) used were based on Englund Dimitrova (2005), with some additional symbols. The recorded think-aloud data amounts to 452.12 minutes (47,754 words in the transcripts) for the group of Novices; 423.63 minutes (48,843 words in the transcripts) for the group of Semi-professionals; and 403.79 minutes (52,944 words in the transcripts) for the group of Professionals.

### 3.3.4. Evaluation

To double-check the validity of the classification of the subjects, which was solely based on their translation backgrounds, two experienced translation evaluators were invited to evaluate the target texts (TTs) produced by all subjects. A five-grade scale which is applied in the Test for English Majors Grade 8 in China (Li, 2001, p.43) was used to mark the translations. The three groups' overall averaged scores for the two translation tasks are shown in figure 2. The group of Professional translators achieved the highest average scores for both texts, while the scores obtained by the group of Novice translators were the lowest. A two-way analysis of variance (ANOVA) was carried out to test to what extent evaluation scores (dependent variable) were affected by subject groups and evaluators (independent variables). Results for Translation 1 indicated a statistically significant difference between groups ( $p=0.000<0.05$ ), but not between different evaluators ( $p=0.914>0.05$ ). Similarly, results for Translation 2 indicated a statistically significant difference between groups ( $p=0.000<0.05$ ), but not between different evaluators ( $p=0.898>0.05$ ). The combination of average scores and statistical results shows that the translations of most of the group of Professional translators received higher grades than those of the Semi-professionals, and similarly the grades of most Semi-professionals were higher than those of the group of Novices. This strongly supports the validity of the classification of subjects.

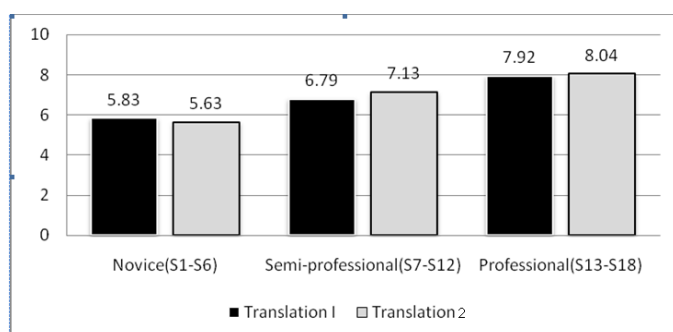


Figure 2. Average scores of each group (maximum score: 10)

## 4. Data analysis

### 4.1 Consultation aim

‘Consultation aim’ refers to the translator’s intention in consulting sources. It is very difficult for this to be investigated in product-oriented TS as it is covert with no traceable sign left in a translation product. However, with the help of TAPs, it becomes overt in transcribed protocols. The consultation aims of subjects in the study were classified under three headings, namely “Discovering Meaning”, “Verifying Meaning” and “Optimizing Expression”. The operational definitions for the headings are listed in Table 3, with their mean values distributed among the different categories of subjects in Table 4.

Table 3. Operational definitions of consultation aims

Consultation aim	Operational definition
Discovering Meaning	The subject exhibits ignorance of the word or phrase, and searches for its meaning by consulting sources.
Verifying Meaning	The subject exhibits a hesitant attitude towards his/her initial understanding of the word or phrase, and verifies it by consulting sources.
Optimizing Expression	The subject exhibits a correct understanding of the word or phrase, and searches for extra optimized expressions or appropriate collocations to fit the particular context.

Table 4. Mean, median and standard deviation percentages for each consultation aim, along with absolute numbers (AN)

	Discovering Meaning				Verifying Meaning				Optimizing Expression			
	mean	median	stdev	AN	mean	median	stdev	AN	mean	median	stdev	AN
Novice translators	50.59%	52.27%	23.16%	56	27.70%	25%	16.79%	32	21.72%	13.39%	22.61%	30
Semi-professional translators	41.03%	45%	27.66%	20	20.99%	20%	18.4%	15	37.98%	38.75%	29.71%	21
Professional translators	15.00%	6.25%	18.64%	8	25.42%	20.83%	31.43%	7	59.58%	64.58%	36.96%	31
Average	35.54%			28	24.70%			18	39.76%			27.3

(Note: the mean, median & standard deviation figures are based on the percentage of each type of consultation aim for each individual subject, then computed for the whole group.)

Results in Table 4 show, firstly, that the average percentage of consultations aimed at “Optimizing Expression” is comparatively higher (39.76%) than that of consultations aimed at “Discovering Meaning” (35.54%) and “Verifying Meaning” (24.70%). Based on the basic dichotomy between comprehension and expression in translation, however, one might argue that both “Discovering Meaning” and “Verifying Meaning” are consultations aimed at input comprehension, while “Optimizing Expression” is aimed at maximizing the quality of output in translation. Viewed from this perspective, results show that consultation aimed at comprehension amounts to 60.24%, approximately 20% higher than consultations aimed at optimizing expression. This disparity (40.3%) is even greater in the case of None-professional translators (Novice and Semi-professional translators), with paired t-test result  $p=0.001<0.05$ , indicating that the difference was statistically significant. It is opposite in the case of Professional translators, with the amount of percentages in “Discovering Meaning” and “Verifying Meaning” approximately 19% lower than that in “Optimizing Expression”. Paired t-test result ( $p=0.214>0.05$ ) indicates that the difference in this group was not statistically significant. Results therefore show that the function of consultation sources for Novice and Semi-professional translators lies mainly in providing meanings for unfamiliar expressions.

Secondly, results show that the percentage of consultations aimed at “Discovering Meaning” decreases significantly at the higher levels of translation proficiency, with paired t-test result  $p=0.048<0.05$ , for the groups of Novice and Semi-professional translators, and  $p=0.003<0.05$ , for Semi-professionals and Professionals, both indicating statistically significant differences. The reason for this would appear to be attributable to translators’ translation experience. Having

accumulated years of experience in translation practice, the group of Professional translators were more confident when translating and tended to work out the meaning of unfamiliar words or phrases through the analysis of the grammar, semantics and syntax of the ST. The logic, context and intertextuality of the ST were also helpful to the group of Professional translators when attempting to discover meaning. In contrast, the group of Novice translators, as a result of their inexperience in translation, believed that they could only translate after they had fully understood every minute detail of the ST. They thus found ambiguity or uncertainty in the meaning of words or phrases very unsettling and placed excessive reliance on consultation sources. This finding, based on English–Chinese translation, supports the arguments in House (2000) and Fraser (1994, 2000) that professional translators are high-risk-takers, while non-professionals are low-risk-takers when using consultation sources. Tirkkonen-Condit (1978, p.160) also suggests that: “a translator has to live with ambiguity. Language is not logic, and all texts are ambiguous”. The translation process of professional translators is generally smoother and more consistent mainly because they are more confident in their decision-making and better at perceiving the overall meaning of the ST with a high level of tolerance of ambiguity and uncertainty.

Finally, the percentage of consultations aimed at “Optimizing Expression” increases greatly at the higher levels of translation proficiency. Based on these average percentages, paired t-tests show that statistically significant differences only exist between Professional and Non-professional translators, with  $p=0.024<0.05$  for the groups of Novice and Professional translators, and  $p=0.048<0.05$  for Semi-professional and Professional groups. These results support Jääskeläinen’s (1989a, pp. 188-189) finding that: “the first-year students...were clearly solving their comprehension problems with the help of a bilingual dictionary [but]...the fifth-year students never used the bilingual dictionary to solve a comprehension problem.” However, in the present context it is more appropriate to say that concomitant with increased experience in translation consultation aims move from comprehension to expression. Some subjects in the group of Professional translators stated in their retrospect interviews that they do not regard glossaries or terminology databases as translation tools but rather as sources offering different meanings for different contexts. When consulting a word in a selected dictionary, they tended to look through all the entries and definitions searching for a similar context to the one under consideration before making a final decision. Example 1 is a typical example of a consultation aimed at “Optimizing Expression”. With the help of options provided by the *Dictionary of Current English Usage* and also with his internal supports (e.g. lexical choice between *chuangli* /create/ and *jianli* /establish/), S18 managed to optimize his translation of ‘conceiving a brilliant scientific theory’.

Example 1. (S18/Professional/V1)

[ST] conceiving a brilliant scientific theory.

(TAPs): 科学理论, 科学理论前面用什么, 什么动词比较好呢? 我查这本辞典, 看看 theory 有什么比较好的搭配, ◇《英语用法大辞典》[14s] ◆theory, 它们用什么字眼呢? 提出, 鼓吹, 建立, 建立一种学说, 这里是科学理论, 科学理论, 证实理论, 创

立理论，阐述理论。好，提出和创立，建立，辞典给出的三种，看我这里用什么好，创立，用创立也不好，前面是创作，都是创，还是建立科学理论。

(English gloss for TAPs): ‘scientific theory’, before ‘scientific theory’ what, what verb is the best? I’ll check this dictionary, to see if there’s a good collocation for ‘theory’, ◇ [ Dictionary of Current English Usage ] [14s] ◆theory, what words do they use? *tichu*<advance>, *guchui*<advocate>, *jianli*<establish>, establish a theory, here is scientific theory, scientific theory, *zhengshi lilun*<confirm a theory>, *chuangli lilun*<create a theory>, *chanshu lilun*<formulate a theory>. ok, *tichu*<advance>, *chuangli* <create> and *jianli*<establish>, of the three options the dictionary gives, let’s see which one is the best here, *chuangli*<create>, *chuangli*<create> is not good, as I have used the word *chuangzuo*<composition> before, and both words start with pronunciation *chuang*, so rather *jianli kexue lilun*<establish a scientific theory>.

## 4.2 Consultation method

‘Consultation method’ refers to the particular consultation sources used by subjects; ‘translation tools’ mainly refers to “those which draw on documentation sources (external supports), such as dictionaries, reference materials, online resources, etc.” (Alves & Liparini Campos, 2009, p.193). In the present study, consultation methods are divided into three main categories: Software Dictionary (SD), Hardcopy Dictionary (HD) and Other Reference (OR). SD is further divided into Bilingual Software Dictionary (BSD) and Monolingual Software Dictionary (MSD). HD is further divided into Bilingual Hardcopy Dictionary (BHD) and Monolingual Hardcopy Dictionary (MHD). OR here refers to Internet Reference (IR) and Paper Reference (PR) (detailed descriptions in Table 5). Due to the uneven distribution of consultation methods (i.e. the vast majority in the BSD category), no statistical test on significance was carried out in this section. The results for consultation methods can be found in Table 6.

Table 5. Operational definitions of consultation methods

Consultation method		Operational definition
Software Dictionary (SD)	Bilingual Software Dictionary (BSD)	A consultation aimed at the TT translation was made by means of a Bilingual Software Dictionary.
	Monolingual Software Dictionary (MSD)	A consultation aimed at the ST explanation was made by means of a Monolingual Software Dictionary.
Hardcopy Dictionary (HD)	Bilingual Hardcopy Dictionary (BHD)	A consultation aimed at the TT translation was made by means of a Bilingual Hardcopy Dictionary.
	Monolingual Hardcopy Dictionary (MHD)	A consultation aimed at the ST explanation was made by means of a Monolingual Hardcopy Dictionary.
Other Reference (OR)	Internet Reference (IR)	A consultation using an internet search engine, typically Google.
	Paper Reference (PR)	A consultation using a non-dictionary paper-based resource.

Table 6. Number and percentage of each consultation methods used by each group

	SD		HD		OR	
	BSD	MSD	BHD	MHD	IR	PR

Novice translators	95 80.51%	9 7.63%	13 11.02%	0	1 0.85%	0
Semi-professional translators	50 89.29%	0	5 8.93%	0	1 1.79%	0
Professional translators	17 36.96%	6 13.04%	15 32.61%	5 10.87%	2 4.35%	1 2.17%
Average	54 68.92%	5 6.89%	11 17.52%	1.67 3.62%	1.33 2.33%	0.33 0.72%

Table 6 shows that SD accounts for an average percentage 75.81% of all consultations and far surpasses HD (21.14%) and OR (3.05%). As an emerging consultation method, SD is widely accepted by translators in general and by language learners. Compared with traditional printed dictionaries, an obvious advantage of SD lies in the ease and speed of data retrieval. Moreover, with the benefit of its enormous memory capacity SD can also satisfy translators wishing to consult several dictionaries for one particular entry, and is especially convenient for translators who are already working on a computer. This trend will accelerate with the on-going development of information technology, better computer-assisted translation (CAT) tools, translation memory system (TMS) and machine translation (MT). Process-oriented studies have already shed some light on consultation sources other than dictionaries (Dragsted, 2004; Alves & Liparini Campos, 2009).

The use of bilingual or monolingual dictionaries has been widely discussed by previous researchers (Jääskeläinen, 1989a; Fraser, 1996; Zhou, 1997). The conclusion they reached may be summarized as follows. In most cases, novice translators seek information first from a bilingual dictionary: they are clearly solving their comprehension problems with the help of a bilingual dictionary. Professional translators, however, show a reverse tendency and clearly prefer using a monolingual dictionary first (particularly when trying to solve a comprehension problem), and show a certain degree of suspicion towards bilingual dictionaries. This tendency is probably fairly characteristic of all advanced translators. Translation teachers therefore “need to develop a range of exercises which moves students’ focus away from using (only) bilingual dictionaries and helps them to develop other strategies for assessing meaning and selecting an appropriate rendering of a source-language term” (Fraser, 1996, p.247). In the present study, the percentage of monolingual dictionary consultations (10.51% in both software and hardcopy versions) was very low for all subjects, and the group of Professional translators showed no specific preference for monolingual dictionaries (23.91%) over bilingual dictionaries (69.57%). I argue that consultation methods are related to multiple factors such as text style, time pressure and personal preferences. For example, in literary works, words or phrases often have associative meanings in addition to their general meaning, and monolingual dictionaries can provide translators not only with complete and detailed definitions of each but also authentic examples of sentences in which they occur. This can be very helpful in ST comprehension and in the clarification of ambiguity. Technical texts, however, are comparatively more straightforward to translate since their contents are of universal application rather than culture-specific, and the lexis used includes exact equivalents. Although subject knowledge is of course more important in this area, what translators generally need

when consulting dictionaries is to be able to find the equivalent expressions for specialist terms. In such cases, bilingual dictionaries in the required specialist field are more helpful to translators. Time pressure also affects the choice of consultation methods. Although time was not strictly limited in the present research, most subjects mentioned in their interview that they preferred to complete translation tasks within the reference time indicated. Therefore SDs (especially bilingual ones) were used by most subjects as the fastest and easiest consultation method. Personal preferences (based on data from selection questionnaires) also influenced the consultation methods used. For example, S3 (Novice) was used to consulting a BHD and this method accounted for 75% of all her consultations even though it was time-consuming. S18 (Professional) was very concerned about collocations and idiomatic expressions in his TTs, and had a special preference for a BHD called the *Dictionary of Current English Usage*. Although working with a computer like the other subjects, all his consultations are made using HDs.

The percentage of different consultation methods used was more evenly distributed amongst the group of Professional translators than amongst the groups of Novice and Semi-professional translators. This would indicate that the Professional translators used more diversified consultation methods in translating. This result supports Varantola's (1998, p.191) recommendation that accurate translation requires a variety of reference sources for "lexicographically sophisticated users". It is easy to appreciate that such diversified consultation methods are associated with diversified consultation aims. For example, when seeking a collocation or optimizing expression, *Dictionary of Current English Usage* (bilingual) and *Longman Dictionary of Contemporary English* (monolingual/bilingual) have much to offer regarding illuminating examples and accurate representations of collocations taken directly from corpus data.

Further study of the Professional translators' TAPs revealed multiple reverse lookups when consulting a bilingual dictionary, which demonstrated their investigative attitude to the consultation process. For example, S13 (Professional translator) looked up "brilliant" in an SD and found that "brilliant" could be translated as "you caiqi de"/(talented/), "zhuoyue de"/(superior/) or "chaoqun de"/(outstanding/). He then consulted the MHD *Xiandai Hanyu Cidian* (Contemporary Chinese Dictionary) and found that the phrase "you caiqi de" (/talented/) is given as an adjectival phrase typically used to qualify a person, not "a scientific theory" as in the ST. He again reverse looked up the other two expressions and finally chose as the most suitable collocation "zhuoyue de" (/superior/). Translators will also combine consultation methods such as dictionaries and internet search engines to confirm their translation choices and optimize expression. For example, noticing that "conceive" was translated as "gouxiang" (/form an idea/) and "shexiang" (/imagine/) in a bilingual dictionary, S14 (Professional translator) then put "gouxiang kexue lilun" (/form a scientific theory/) and "shexiang kexue lilun" (/imagine a scientific theory/) into Google search and finally chose the former expression. Reverse lookup as a consultation skill proved to be very helpful in the decision-making process especially when the translator was faced with problems of synonyms and collocations. An SD or IR can help translators with

reverse lookups in a very fast and efficient way compared with printed dictionaries or materials. Professional translators are more skilful in combining multiple consultation methods to serve their consultation aims.

### 4.3 Decision-making

‘Decision-making’ refers to decisions made in the process of each consultation performance; and the unit of analysis is “a consultation” as defined in 3.3.2, and extracted from subjects’ TAP data. Based on PACTE (2009) and also my own observations, decisions made in the process of each consultation performance may be divided into four categories, namely Simple External Support (SES), Predominantly External Support (PES), Predominantly Internal Support (PIS) and Problem Shelved (PS). The operational definitions may be found in Table 7. The mean, median and standard deviation percentages for each type of decision-making process, along with the absolute numbers (AN) can be found in Table 8.

Table 7. Operational definition of decision-making

Decision-making	Operational definition
Simple External Support (SES)	The Definitive Solution is based exclusively on the consultation of bilingual resources, from which a variant offered is accepted in the translation.
Predominantly External Support (PES)	The Definitive Solution is based predominantly on external support, i.e., any combination of consultations that includes consultations of bilingual resources from which a variant offered is adopted in the translation.
Predominantly Internal Support (PIS)	The Definitive Solution is based predominantly on internal support, i.e., any combination of consultations which <b>does not</b> include a consultation of bilingual resources from which a variant offered is adopted in the translation.
Problem Shelved (PS)	No ideal solutions achieved after resource consultation and the problem is temporarily shelved.

Table 8. Mean, median and standard deviation percentages for each type of decision made, along with the absolute numbers (AN)

	SES				PES			
	mean	median	stdev	AN	mean	median	stdev	AN
Novice translators	29.30%	26.14%	16.71%	34	31.96%	26.79%	22.20%	37
Semi-professional translators	19.24%	19.09%	14.36%	11	45.54%	44.16%	28.82%	25
Professional translators	4.58%	0	10.84%	2	38.99%	43.75%	32.88%	17
Average	17.71%			15.7	38.83%			26.33
	PIS				PS <sup>7</sup>			
	mean	median	stdev	AN	mean	median	stdev	AN
Novice translators	35.91%	34.52%	12.64%	43	2.83%	0	4.49%	4
Semi-professional translators	34.39%	32.47%	31.76%	19	0.83%	0	2.64%	1
Professional translators	48.65%	50%	34.47%	22	7.78%	0	12.88%	5
Average	39.65%			28	3.81%			3.33

(Note: the mean, median & standard deviation figures are based on the percentage of each type of decision-making process for each individual subject, then computed for the group as a whole.)

Results show that PIS and PS account for 43.46% of all decision-making processes, i.e., more than two out of five consultations could not be solved using



variants offered in external sources. This shows to some extent the limitations of consultation sources, especially bilingual dictionaries, in which the definitions and equivalents provided simply cannot fit all translation contexts, but rather serve as clues and guidance for translators to work out the most appropriate translation in specific TT contexts and styles. Moreover, the fact that higher percentages were obtained for PES than SES indicates that specific situations or contexts are always taken into consideration in decision-making processes and internal support is usually involved.

Substantial differences exist in the percentage of decisions made using SES in the different groups, with Novice translators showing the highest and Professional translators the lowest. Paired t-tests indicate that statistically significant differences exist between the groups of Novice and Semi-professional translators ( $p=0.039<0.05$ ) and the groups of Semi-professional and Professional translators ( $p=0.010<0.05$ ). TAP data show that the group of Novice translators usually had little patience in reading all the entries in a consultation source and tended to pick out one for use in their TT without engaging in careful consideration, while Professionals had a more diligent attitude when they decided to consult resources. Example 2 is representative of the consultation behaviour of many of the Novice translators: uncertainty about a word, checking the word, and directly picking an equivalent. However, in the consultation process of a Professional translator, as in Example 3, a diligent, an investigative attitude towards consultation sources is clearly evidenced. Instead of stopping consultation at the first definition found, S18 continued to read on to the third definition of “straightforward” even though the second was found to be acceptable. His final decision was made based on a careful comparison of all the three options.

Example 2. (S6/Novice/V1)

**(TAPs):** 我查一下 ‘straightforward’这个词，这个词不是很确定 / ◇《金山词霸》[4s]◆对，就是直截了当的。就是说 / 先把这个写上去吧。

**(English gloss for TAPs):** I’ll check ‘straightforward’, I’m not very sure about the word/◇《Kingsoft Powerword》(4s)◆yes, it means *zhijieliadang de<without preamble>*. That is to say / type it first.

Example 3. (S18/Professional/V1)

**(TAPs):** 这里的 straightforward 修饰 processes，我来查一查，看它怎么说比较好 ‘straightforward’ ◇《朗文词典》[10s]◆straight...straightforward, straightforward...第一个意思是坦率老实，这个显然不是用在机器上的，这个不对的；第二个意思呢，*not difficult to understand*，比较易懂的，简单的，易懂简单的吗？这里可以，简单的过程，简单的过程/可以/第二个意思可以；再看看第三个意思，能不能套上去呢？*not limited or lessened by any conditions; not limited or lessened by any conditions* / 是直截了当的，直截了当的过程好像不通。所以三个意思里面呢，恐怕还是第二个意思，我就决定先采用第二个意思。

**(English gloss for TAPs):** Here ‘straightforward’ modifies ‘processes’, have a check, see how to best to translate it, ‘straightforward’ ◇《Longman Dictionary》[10s]◆‘straight...straightforward, straightforward’...the first meaning is *tanshuai laoshi<candid, honest>*, obviously not for a machine, it is not right; the second meaning is, *not difficult to*

*understand*, easy to understand, simple, does that mean easy to understand and simple? Here ok, *jiandan de guocheng*, *jiandan de guocheng* <*simple process*, *simple process*>/ok/the second meaning is ok; have a look at the third meaning, will it fit the text or not? *Not limited or lessened by any conditions*; *not limited or lessened by any conditions* / It is *zhijieliadang de* <*without preamble*>, *zhijieliadang de guocheng*<*without preamble process*> sounds awkward. So among the three meanings, it still seems to be the second meaning, so I'll use the second meaning.

The percentage of decisions made by the group of Professional translators using PIS (48.65%) was higher than that of the group of Novices (35.91%) and Semi-professionals (34.39%). Paired t-test results show that the differences between the Novice and Professional groups ( $p=0.000<0.05$ ), and the Semi-professional and Professional groups ( $p=0.019<0.05$ ) were statistically significant. The features of PIS, similar to the description in Fraser (1996, p.247),

“instead of using dictionaries to establish meaning, using them to refine the meaning of source-language terms and/or to stimulate the search for target-language equivalents...it was the development of the text, rather than the limited dictionary entry, that prompted the most appropriate rendering”,

may thus serve as a further indicator of the Professional translators' investigative attitude to the consultation process. The results obtained for PIS are in line with PACTE (2009, p.224), which show that PIS was used more often by expert translators (42.4%) than by foreign-language teachers (29.2%). “Instrumental competence may therefore be considered to constitute a further characteristic of expertise in translation” (PACTE, 2009, p.227).

In the present study, the use of PIS was also found to be closely associated with subjects' consultation aims. As indicated in 4.1, about 60% of the Professional translators' consultations were aimed at “Optimizing Expression” compared with 37.98% of Semi-professionals and 21.72% of Novice translators. Making some adjustments to entries in resource using internal support is obviously a sensible decision in order to obtain optimized or idiomatic expressions. Professional translators would thus be expected to have a much higher percentage of decisions made using PIS as compared with Semi-professional or Novice translators. A study of Novice translators' think-aloud transcriptions reveals that some Novice translators adopted PIS when they misunderstood the ST meaning, and tried to reconstruct coherence and logical expression in their TT by means of modifying possible equivalents in consultation sources. For example:

Example 4. (S5/Novice/V1)

(ST):[...] in terms of creativity.

(TAPs): 嗯 ‘in terms of creativity’, ‘in terms’ 是包括还是不包括? ◇ 《金山词霸》[4s]

◆ in terms, 词典上说在谈判[协商]中, 噢, 就是在相关的讨论里 / 诠释 / 诠释为相关/的思想/为

(**English gloss for TAPs**): Um, ‘in terms of creativity’, ‘in terms’ means included or not included? ◇ 《Kingsoft Powerword》 [4s] ◆ ‘in terms’, an equivalent in the dictionary is *zai tanpan[xieshang] zhong* <in negotiation/discussion>, ok, that means in the relevant discussion / *quanshi* / *quanshi wei xiangguan* / *de sixiang* / *wei* <to interpret / to interpret as relevant / idea / as>

S5 (Novice translator) did not notice that “in terms of” is a fixed term and incorrectly looked up “in terms” in a BSD. As the Chinese equivalent “*zai tanpan [xieshang] zhong*” (/in negotiation/discussion/) does not fit in the context of the TT at all, she decided to further seek internal support and adjusted the target expression to “to interpret relevant idea as”, which is far removed from the meaning of the ST. The above example reminds us that adjusting the equivalent of an entry should be based on an accurate understanding of the ST, and the adjusted expression should fit as an idiomatic TT expression in both semantic and syntactic respects.

#### 4.4 Outcomes

In addition to determining the number of consultations made by each subjects, which was easy to compute from the TAP transcriptions, I also investigated the “Acceptance rate” of the results of these consultations using the dichotomous classification accept – reject. “Accept” refers to the solution offered by a consultation source that is accepted and used in the translation. In Example 5, the affirmative expression “yes” after consultation followed by the use of a term from the consultation source indicates “Accept”. “Reject” refers to a definition/equivalent of an entry in a consultation source that is rejected and thereafter the subject searches for other solutions, or temporarily shelves the translation problem. In Example 6, the negative comment “none is any good” after consultation followed by the rejection of Chinese equivalents from a dictionary indicates “Reject”. “Acceptance rate” refers to the percentage of “Accept” results in all consultation activities. Table 9 shows the number of consultations, the number of “Accepts” and the “Acceptance rate”.

Example 5. (S8/Semi-professional/V1)

(ST): [...]in conceiving a brilliant scientific theory.

(TAPs): ‘conceive’, 或者，嗯 / 叙述？这好像不对呀 / 我查 conceive ◇ 《金山词霸》 [4s] ◆ 构思，嗯，对↓，或者，构思，一个，绝妙/的/科学/理/论。

(**English gloss for TAPs**): ‘conceive’, or, um / *xushu* <recount>? Seems not right/Check ‘conceive’ ◇ 《Kingsoft Powerword》 [4s] ◆ *gousi* (conceive), um, yes↓, *huozhe, gousi, yige, juemiao/de/kexue/li/lun* <or, conceive, a, brilliant/scientific/theory>.

Example 6. (S16/Professional/V1)

(ST): [...]in conceiving a brilliant scientific theory.

(TAPs): ‘brilliant, brilliant’ / (怎么)是明智的还是高超的还是什么呢？查一下。◇ 《金山词霸》 [5s] ◆ 嗯 / 金山词霸上讲是灿烂的、闪耀的、有才气的，都不好 ◆ / 构思一个 / 构思一个 / 暂时用光辉的吧 / 光辉的 / 科学理论。

(English gloss for TAPs): ‘brilliant, brilliant’/(what) Is it mingzhi de <wise> or gaochao de<excellent>, or something else? Check.◇ [Kingsoft Powerword] [5s]◆um / Powerword says *canlan de<splendid>*, *shanyao de<dazzling>*, *you caiqi de<talented>*, none is any good◆/gousi yige<conceive a> / gousi yige <conceive a>/Well, just use guanghui de<glorious > now/ guanghui de / kexue lilun< glorious / scientific theory>.

Table 9. Number of consultations, ‘Accepts’ and ‘Acceptance rate’

	Consultations	Accepts	Acceptance rate
Novice translators	118	73	61.86%
Semi-professional translators	56	29	51.79%
Professional translators	46	22	47.82%

Results show that the number of consultations made by the group of Novice translators is greater than that of the Semi-professional and Professional translators, indicating that, with increasing translation experience, a translator tends to reduce the frequency of use of consultation sources. This finding is apparently in line with previous researchers’ arguments, such as: “due to their better proficiency in English and their experience in translation, the fifth year students (Professionals) had to look up fewer items in dictionaries than the first year students (Novices)” (Jääskeläinen, 1989a, p.188) and “less experienced subtitlers typically sought help from dictionaries (either traditional or electronic) much sooner than more experienced ones, who first searched in their memory or used deduction” (Kovčáči, 1997, p.234). These results also support Prassl (2010), who found that ‘reflected decisions’ (mainly resorting to consultation sources) accounted for 80% of all decisions in the Student group, while it only accounts for 44% in the Professional group.

Further study of think-aloud transcriptions, however, revealed that, apart from experience in translation, the number of consultations could also be attributed to subjects’ consultation efficiency (cf. Wakabayashi, 2003, p.66). The group of Novice translators displayed a much higher level of “repetitive consultation”<sup>8</sup> compared to Semi-professional and Professional translators. The think-aloud transcriptions also revealed that the Novice translators rarely read dictionary entries from beginning to the end and thus often overlooked valuable information that would be have been helpful in solving their translation problem (cf. Example 2). In contrast, the group of Professional translators tended to study all the explanations of a word or phrase in order to discover more ideal solutions in the source consulted (cf. Example 3). Moreover, due to their extensive reliance on consultation sources, Novice translators tended to look up a word or phrase hastily to save translation time. Being heavily-loaded with code-switching, their working memory limitations tended to reduce their working efficiency, leading to the emergence of repetitive consultations; whilst for Professionals, skilled memory enabled them to “rapidly encode, store, and retrieve information within the domain of their expertise and thereby circumvent the capacity limitations that typically constrain novice performance” (Ericsson & Staszewski, 1989, p.263).

Along with the number of consultations made, the acceptance rate for consultations made by the three groups of subjects also declined in line with increased experience in translation. This result was to be expected, and is largely attributable to

the different consultation aims of each group, as evidenced in this study. The main consultation aim for the group of Novice translators was to discover and verify the meaning of unfamiliar words or phrases (78.29% in total): this was an aim which consultation sources could meet satisfactorily. Professional translators' consultation aims, however, focused on optimizing expression, but as a result of the limited assistance translation resources offered in this area, they resorted to working out the TT expressions themselves, largely based on their general knowledge and sense of language (cf. Alves & Liparini Campos, 2009, p.208). This leads to a lower acceptance rate of consultations in external sources. Moreover, Professional translators were more demanding of their TT expressions and were reluctant to unquestioningly accept the equivalents provided by the consultation sources. This follows from the higher standards they expect of their TT versions. For this reason, they approach translation problems as seriously as a research problem, and regard cursory acceptance of equivalents of entries from consultation sources as inimical to good translation. This is why Professional translators, with the highest scores for their translation products, have the lowest acceptance rate of their consultation sources.

## **5. Conclusion**

Supported by the data from TAPs, evaluation and retrospective interviews, this paper has analyzed the differences in consultation performance of three groups of translators. Results show that different aspects of consultation, namely consultation aims, methods, decision-makings and outcome, interact with each other in the process of consultation. Further conclusions about these four aspects of the consultation process are summarised below:

(1) The findings on consultation aims reveal that the greater a translator's degree of proficiency, the less his/her consultation aims focus on "Discovering Meaning". This demonstrates that consultation aims tend to move from comprehension to expression with enhanced translation experience.

(2) Overall findings related to consultation methods show that Software Dictionaries, because of their distinct advantage in ease and speed of data retrieval, were used by all three groups of translators. However, these findings do not support the argument that Professional translators show special preference for monolingual dictionaries over bilingual dictionaries. Instead, it may be concluded that Professional translators display a more diversified approach in their consultation methods, an indication of their investigative attitude in the consultation process. Moreover, their consultation methods are closely related to multiple factors such as text style, time pressure and personal preferences.

(3) A higher percentage of decisions were made in the consultation process using Predominantly External Support as opposed to Simple External Support, thus indicating that when making decisions in the consultation process, macro and micro contexts are always taken into consideration and internal support is usually involved. Novice translators showed a higher percentage of decisions made using Simple

External Support compared with Professional translators. TAP transcriptions also revealed that they usually had little patience in reading all definitions/equivalents of an entry, but rather picked out one for use in the TT without engaging in careful consideration. On the other hand, Professional translators showed a much higher percentage of decisions made using Predominantly Internal Support. This coincides with PACTE's (2009) finding that PIS is more characteristic of professional translators. It also serves as an indicator that Professional translators take an investigative attitude in the consultation process.

(4) The number of consultations made is in inverse proportion to a translator's experience. This is in line with findings in Jääskeläinen (1989a), Kovčáči (1997) and Prassl (2010). We can further conclude that apart from translation experience, the number of variants accepted ("Accepts") can also be attributed to subjects' consultation efficiency. The "Acceptance rate" decreases in line with increased translation experience, a factor which is closely related to subjects' consultation aims and their expectations of consultation sources.

This paper offers an English-Chinese translation perspective on a number of important questions relating to translator competence. I am mindful of its limitations, in particular the fact that the number of subjects is not large enough to support more definite conclusions. It would be beneficial if a longitudinal study on translation competences, as conducted by the TransComp project (University of Graz) and the CTP project (Zurich University), could be extended to include research on English-Chinese translation. This is a possible future project that would provide a broader perspective on the topic.

## Notes

1. The term “consultation sources” is more suitable than “translation instruments” for the present research, since it mainly covers consultation of different dictionaries, online and paper resources, with no CAT technology or translation memory systems involved.
2. This remotely related language pair might distinguish itself from closely related ones in translating, as is generally agreed that translation between closely related languages is substantially easier than remotely related languages.
3. The data of 2 subjects were rejected based on observation and retrospective interview data, which revealed that the subjects had failed to grasp the basic TAPs method, could not articulate their thinking processes adequately and produced unsatisfactory performance.
4. In this regression analysis, TOEFL scores serve as the dependent variable, with translation scores for Text 1 and Text 2 as the independent variables. The regression model is “Score (TOEFL)= + 607.3 + 0.1227\*Score(Text 1)+1.555\*Score(Text 2)”. The results (cf. Table 10) show that for Score (TOEFL) and Score (Text 1),  $p=0.956>0.05$ , and for Score (TOEFL) and Score (Text 2),  $p=0.472>0.05$ , indicating that there is no statistically significant correlation coefficient between subjects’ TOEFL scores and their translation performances.

Table 10. Correlational analysis of TOEFL scores and translation scores

	Coefficient	Std.Error	t-value	t-prob Part.	R <sup>2</sup>
Constant	607.324	7.546	80.5	0.000	0.9977
Score(Text 1)	0.122717	2.205	0.0557	0.956	0.0002
Score(Text 2)	1.55548	2.108	0.738	0.472	0.035

5. The requirement of having officially published translation products serves as an important criterion for Professional translators in the present research.
6. LIX is also known as Laesbarhetsindex in Swedish (i.e. readability index) which can be used to test the readability of English, French, German, Greek and Swedish.
7. As can be seen from Table 8, both absolute numbers and percentages for PS are not large enough to carry out statistical analysis, notwithstanding the fact that this kind of decision does exist in consultation. It is better to leave this for future study based upon a larger number of observations.
8. “Repetitive consultation” means that during the translation process a translator repeatedly checks a word or phrase of multiple occurrence.

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## Appendix: Transcription conventions

/	Unfilled pause in the verbalizations of less than 2 seconds
[5s]	Unfilled pause with length in seconds
◇ ◆	Start and end of consultation process
‘ ’	The word or phrase to be consulted are put in inverted comma
【 】	Notes provided by the transcriber, such as dictionary lookups, paralinguistic signals, etc.
↑ ↓	Rise and fall tone
( )	Inaudible parts of the recordings
<u>underlining</u>	Underlining indicates that the subject is writing on the computer at the same time (determined by the sound of the computer keys)
<i>italics</i>	Chinese Pinyin of entries from consultation sources
< >	Gloss English translation for entries and TTs in TAPs